

Eisenberg and Berkowitz- The Big 6

Questioning Raising the information need	Task Definition	Determine exactly what the problem is – What is the problem to be solved?	Provides focus to answering the question “What is the problem?”	(Basic) Concept mapping and graphic organizers (6.1 NETS) (Advanced) Asking essential questions: (http://www.joycevalenza.com/questions.html) Ask essential questions to “promote deep and enduring understanding”
		Determine the specific information needs related to the problem- What information is needed in order to solve the problem?		
Exploring Reading, viewing, listening	Information Seeking Strategies	Determine Range of Sources – What are all possible sources?	Creates a search plan to answer, “How do I find out?”	Decide which reference sources are likely to provide information, inventory all the computer resources (Basic) Encourage students to use search directories when search engines become frustrating- lii.org, KidsClick!, Google directory; (Basic to Advanced) Evaluate web sites (5.3 NETS)
		Prioritize Sources – What are the best of all the possibilities?		
	Location and Access	Locate Sources – Where are these sources?	Sorts the information to answer “What have I got?”	(Basic) Key word searching that compares the results using several different engines; teach Boolean logic (5.1) (Advanced) try metasearch engines; explore advanced features of search engines
		Find information – Where is the information within each source?		
	Information Use	Engage with information – What information does this source provide?		(2.2 NETS) (Basic) Determine accuracy, relevance, and comprehensiveness; create bibliographic citations- can use interactive web tool (Advanced) Identify point of view
Assimilation Accepting, incorporating or rejecting	Information Use	Extract information – What specific information is worth applying to the task?	Select the information to answer, “What is important?”	Extract information using notes, copies, citations; outline major points (2.2 NETS) (Basic) Distinguish between summarizing, paraphrasing and quoting;
Inference Application for solution and meaning	Synthesis	Organize Information – How does the information from all sources fit together?		Can be as simple as relaying a specific fact; very complex involving several sources, a variety of media or presentation formats, and the effective communication of abstract ideas Create an outline; (3.2, 4.2 NETS) critical thinking (www.criticalthinking.org)
		Present Information – How is the information best presented?		
Reflection Adjustment for additional questioning	Evaluation	Judge the product – Was the information problem solved?		Decide whether or not an assignment is finished; Judge the product’s effectiveness; Judge the efficiency of the information problem-solving process: what techniques of note taking worked best, what would you do differently
		Judge the process- What have I learned?		

Carol Kuhlthau – Information Search Process (ISP)

Questioning Raising the Information Need	Stage 1 – Task Initiation	To prepare for the decision of selecting a topic – recognize a need for information	Apprehension and uncertainty	Strategies: brainstorming, discussing, contemplating possible topics Actions: talking with others, browsing the library, writing out questions
	Stage 2 – Topic Selection	To decide on topic for research – identify and select the general area or topic to be investigated	Confusing, anxiety, brief elation after selection, anticipation	Strategies: discussing possible topics, using general sources for overview of possible topics (pre-reading), read widely Actions: making preliminary search of library, using reference collection to seek background information in the general area of concern, read for overview.
Exploring Reading, Viewing, Listening	Stage 3 – Prefocus Exploration	To investigate information with the intent of finding a focus and extending personal understanding	Confusing, doubt, uncertainty	Students might be unable to always express precise information needed Strategies: reading to learn about topic, intentionally seeking possible focuses or point of view, maintain list of key words Actions: locating relevant information, read to learn more about the topic, list facts, ideas, names, and events (look at recalling, summarizing, paraphrasing), making bibliographic citations of useful sources and potential leads
	Stage 4 – Focus Formulation	To formulate a focus from the information encountered	Turning point where uncertainty diminishes and confidence increases	Thoughts become more clearly defined as a focused perspective of the topic is formed Strategies: making a survey of notes, listing possible foci, choosing a particular focus while discarding others, combining several themes to form one focus Actions: reading and organizing notes for themes.
Assimilation Accepting, Incorporating, Rejecting	Stage 5 – Information collection	To gather information that defines, extends and supports the focus	Confidence in ability to complete task increases, increased interest	Users have a clearer sense of direction and can specify the need for particular information Actions: taking detailed notes with bibliographic citations relevant to focus and research questions. Strategies: using key words to search out pertinent information, making comprehensive search of various types of materials(reference, periodicals, nonfiction, etc), seek guidance
	Stage 6 – Search Closure	To conclude search for information to prepare for presenting or writing	Sense of relief, satisfaction/ Disappointment	Strategies: returning to library to make summary, identifying need for any additional information, and exhausting resources. Actions: rechecking sources for information initially overlooked, confirming information and bibliographic citations
Inference Application for Solution and Meaning				
Reflection Adjustment for additional questioning				

Pathways to Knowledge (Pappas and Tepe)

Questioning Raising the Information Need	<u>Appreciation and Enjoyment</u>	Sensing, viewing, listening, reading, curiosity, enjoyment	
		Develop an overview	Brainstorm, formulate initial questions, build background, identify key words, relate to prior knowledge, explore general sources.
Exploring Reading, Viewing, Listening	<u>PreSearch</u> - establish a focus	Explore Relationships	Define questions, cluster, outline, webbing, listing, and narrowing and broadening Provides searchers with strategies to narrow their focus and develop specific questions or define information need Makes a connection between their topic and prior knowledge
	<u>Search</u> – planning and implementing search strategy	Identify Information providers	Home and computer resources, museums, zoos, historical sites, libraries, etc.
		Select information Resources and Tools	Indexes, people, Internet, media, reference resources, etc.
		Seek Relevant Information	Skim and scan, interview, confirm information and sources, record information, determine relevancy of information, explore and browse widely
Assimilation Accepting, Incorporating, Rejecting	<u>Interpretation</u> -	Interpret Information	Assessing usefulness of information and reflecting to develop personal meaning Compare and contrast, integrate concepts, determine patterns and themes, infer meaning, analyze, synthesize, classify, filter, organize, and classify
Inference Application for Solution and Meaning	<u>Communication</u> Construct and present new knowledge	Apply information	Choose appropriate communication format, solve a problem, answer a question, and respect intellectual property
		Share new knowledge	Compose, design, edit, revise, use most effective medium such as video, report, mural, portfolio, and animation
Reflection Adjustment for additional questioning	<u>Evaluation</u> Think about process and product	Evaluate	End product, effective communication, redefining new questions, use of resources, meeting personal information needs. Evaluation is ongoing in their nonlinear information process and should occur throughout each stage. Through this continuous evaluation and revision process that searchers develop the ability to become independent searchers.

I-Search (Macrorie)

Questioning – Raising the Information Need	Phase 1 – Selecting a Topic	Teachers: Introduce theme/ overarching concepts OR student interest Elicit students prior knowledge OR create an interest web and “What I Knew Before I started my I-Search” Help students build background knowledge – skim and scan for information Have students reflect on what they are learning OR choose a topic and reflect “Why I Chose this Topic” Help them find questions to pursue – “skinny” vs. “fat”	Students: Use a graphic organizer to begin formulating questions Sent follow up letters to guest speakers to help them process information, generate new questions, and thank the speaker Computer simulations KWL charts
Exploring Reading, Viewing, Listening	Phase 2 – Designing a Search Plan	Teachers: Guide students to develop a plan by discussing different sources for each of the four ways Introduce students to a process for citing and/or keeping track of materials and resources	Students: Develop a search plan that involves gathering information in four ways: reading, watching, asking, and doing. – create a brainstorming chart for read, watch, ask, do Describe sequence for gathering information – create a calendar to illustrate what they will be doing during each class period
	Phase 3 – Gathering and Integrating Information	Teachers: Support students as they delve into content, form conceptualizations and gestalts, and think critically about what they are learning Introduce strategies to help them sort, create semantic maps, make categories, create charts and figures, draft summaries. Help students generate good, fat interview questions	Students: Follow search plan, revising as necessary Gather, sort, and integrate information Analyze and synthesize information to make meaning Write in their journals reflecting on the ups and downs of their search process Create Venn diagrams, idea maps, and categorize information
Assimilation Accepting, Incorporating, Rejecting	Phase 4 – Representing Knowledge	Teachers: Explain criteria for evaluation Give examples of possible ways to present information Give students time, a method, and support to produce a product that will represent what they have learned Create a reflection process	Students: Convey information about the following: My questions My Search Process What I have learned What this means to me References Prepare reports and projects through a variety of venues Engage in the process of designing, drafting, revising, editing and producing or publishing their work
Inference Application for Solution and Meaning			

Stripling and Pitts Research Process Model (REACTS)

Questioning – Raising the Information Need Exploring Reading, Viewing, Listening	<u>Recalling</u> Fact-finding; reporting on the information	Choose a broad topic		Calls on students to do preliminary reading and information seeking in anticipation of narrowing the topic, creating a thesis, and writing research questions.
		Get an overview of the topic		
	<u>Explaining</u> Asking and Searching; posing who, what, when, where questions and finding the answers	Narrow the Topic	Reflection Point: Is my topic a good one?	
		Develop a Thesis or Statement of purpose	Reflection Point: Does my thesis statement of purpose represent an effective, overall concept for my research?	
	<u>Analyzing</u> Examining and organizing; posing why and how problems and organizing information to fit the product	Formulate Questions to guide research	Reflection Point: Do the questions provide a foundation for my research?	
		Plan for research and production	Reflection Point: Is the research/ production plan workable?	
Assimilation Accepting, Incorporating, Rejecting		Find / Analyze / Evaluate Resources	Reflection Point: Are my sources usable and adequate?	
	<u>Challenging</u> Evaluating and deliberating; judging information on the basis of authority, significance, bias, and other factors	Evaluate evidence / take notes / compile bibliography	Reflection Point: Is my research complete?	
Inference Application for Solution and Meaning	<u>Transforming</u> Integrating and concluding; drawing conclusions and creating a personal perspective based on information obtained	Establish conclusions/ organize information into an outline	Reflection Point: Are my conclusions based on researched evidence? Does my outline logically organize my conclusions and evidence?	
	<u>Synthesizing</u> Conceptualizing: creating original solutions to problems posed			
		Create and present final product	Reflection Point: Is my paper/ project satisfactory?	

Research Cycle (Jamie McKenzie)

Questioning – Raising the Information Need	Questioning	Clarify and map out the dimensions of the essential question being explored	Brainstorming to form a cluster diagram of all related questions Subsidiary questions will guide subsequent research efforts Emphasize research questions that require problem-solving or decision-making – they are questions that cause students to make up their own minds and fashion their own answers
Exploring Reading, Viewing, Listening	Planning	Think strategically about the best ways to find and organize pertinent and reliable information	Wise students will ask for help in this stage If they use cluster diagramming for note-taking they can simply attach their findings as notes to the relevant part of the diagram Goal of planning is to create a storage system that will protect students from accumulating huge mountains of information in hundreds of poorly named files Organization around key ideas, categories and questions increases the likelihood that gathering will induce, provoke, and inspire thought.
	Gathering	Proceeds to satisfying information sites swiftly and efficiently	Gathering only the information that is relevant and useful Critically important that the findings are structured as they are gathered It is also crucial that students only use the Internet when likely to provide the best information – in many cases other sources will prove more efficient and more useful
Assimilation Accepting, Incorporating, Rejecting	Sorting and Sifting	Moves towards more systematic scanning and organizing of data already collected	Much selecting and sorting should occur during the previous stage This stage is to set aside data that will most likely contribute to insight.
	Synthesizing	Looking for patterns or some kind of picture	Students arrange and rearrange the information until patterns and pictures begin to emerge.
Inference Application for Solution and Meaning	Evaluating	Ask if they need more research before reporting	Timing of reporting and sharing of insights is determined by the quality of the “information harvest” during this stage Students must usually complete several repetitions of the cycle because they usually don’t know what they don’t know when they first plan their research
	Reporting		

Ws of Information Inquiry (Lamb)

Questioning Raising the Information Need	Watching	Exploring	Become more in tune with the world	Exploring/Observing	Stop and enjoy – describe how you feel – diagram ideas
				Reading and Viewing	Explore different sources including news – read for pleasure
				Writing	Journal writing to explore ideas
				Discussing	Collaboration for ideas/opinions – make a list of topics
				Contemplating	Explore the possibilities of your topics by reflecting on your feelings
	Wondering	Questioning	Focus on a topic, theme, issue, or problem	Finding Purpose	What is the problem I need to solve? What is the question I want to ask?
				Questioning	list questions about your topic and possible key words – review questioning techniques
				Connecting Prior Knowledge	Connect ideas to prior knowledge including attitudes, experience, and knowledge through brainstorming – KWL chart – help identify what you actually need to find out
				Finding Focus	Organize ideas (graphic organizer) for a focus
				Narrowing Topic	Making it more manageable – view large project in smaller chunks – assign roles in groups – create meaningful questions
				Contemplating	Select and reflect on a topic
Exploring Reading, Viewing, Listening	Webbing	Searching	Create a search strategy for identifying useful information	Plan a search strategy	Analyze questions to determine best approach to information webbing, identify types of information that would be useful, select resource formats
				Identify Key Ideas	Think about key words and headings to use in search – use who, what, when, where, why, and how's
				Use Starting Points	3 – 5 resources to get kids started “pathfinders” – provides background information
				Web Information	Add strands to your web of information
Assimilation Accepting, Incorporating, Rejecting	Wiggling	Evaluating	Use and evaluate information resources	Using information resources	Reception scaffolds, skimming and scanning, filtering information
				Evaluating information	Evaluate information for authority, accuracy, currency, etc.
				Communicating/ collaborating	identifies holes in your thinking, can involve and expert, not just peers
	Weaving	Synthesizing	Process information	Processing information	Concept mapping, comparing information, selecting useful information, organizing and clustering key ideas, analyze
				Reviewing the results	Have questions been addressed? Do you need to evaluate new questions? Are there holes?
				Citing sources	Teach bibliographies, online wizards – understand plagiarism/copyright laws
Inference Application for Solution and Meaning	Wrapping	Creating	Select and develop a product	Choose a product	Product options, start with audience
				Plan a product	Create production scaffolds, storyboards, guidelines
				Develop a product	Technology tutorials
	Waving	Communicating	Communicate with an audience	Identify Audience	Who needs to hear, see or read about your ideas?
				Communicate	How will you share your ideas to your audience?
Reflection Adjustment for additional questioning	Wishing	Assessing	Assess project and reflect on process	Product	Rubrics, teacher and student assessment
				process	Reflective questions, what would you do next time?

	8 Ws	Big 6	ISP	I-Search	Pathways	Research Cycle	REACTS
1	Watching Become more in tune with the world Wondering Focus on topic or issue through questioning, finding focus, narrowing topic, and webbing	Task Definition What is the problem? What information is needed to solve the problem – concept mapping and asking questions	Initiation Prepare for selection of topic by brainstorming Topic Selection Decide on topic through prereading	Selecting a Topic Introduce theme, elicit prior knowledge, choose a topic, generate questions	Appreciation and Enjoyment PreSearch Develop an overview-brainstorm, formulate initial questions	Questioning Clarify and map out dimensions of essential question	Recalling Choose a broad topic and get an overview Explaining Narrow the topic from presearch and develop a thesis or purpose Is My topic good? Does thesis represent overall concept? Analyzing Formulate questions to guide research, plan for research Do questions provide foundation? Is plan workable?
2	Webbing Create search strategy to identify useful information – key words, sources, add to web	Information Seeking Strategies Determine range of sources and prioritize Locate Sources Locate sources and information in them. Information Use Engage with info	Prefocus exploration Investigate to find a focus and deeper understanding Focus Formulation Reading and organizing notes for themes	Designing Search Plan Different sources (read, watch, ask, do) and sequence to gather Gathering and Integrating Follow search plan	Presearch Develop an overview and explore relationships Search Identify information providers, select resources and tools, seek relevant information	Planning Best ways to organize and find info Gathering	
3	Wiggling Use and evaluate information Weaving Process information by reviewing results	Information Use Extract information What is important?	Information Collection Gather info that defines, extends and supports	Gathering and Integrating information Sorting, categorizing, reflecting	Interpretation Compare contrast, analyze, classify, filter	Gathering Finding info that is relevant and useful Sorting and Sifting Set aside data that will contribute to insight Synthesizing Looking for patterns and pictures	Analyzing Find/analyze/evaluate resources Are source usable/accurate? Challenging Evaluate evidence, take notes, compile bibliography Is research complete?
4	Wrapping Select and develop product Waving Communicate with audience	Synthesis Organize and present information		Representing Knowledge Convey information of product and process Engage in process of creation	Communication Apply information to a format and share knowledge	Evaluating Do I need more research for new questions before reporting? Reporting	Transforming Integrating, concluding Conclusions based on research? Synthesizing Creating original solutions to problem posed
5	Wishing Assess product and reflect on process	Evaluation Judge product and process	Search Closure Identify need for more info, conclude search		Evaluation Process and product		

Portfolio of Information Skills (Key Words, 31)

Questioning Raising the information need	What do I need to do?	<ul style="list-style-type: none"> Analyze the information task Analyze the audience's information need or demand Describe a plan of operation Select important or useful questions and narrow or define the focus or the assignment Describe possible issues to be investigated
Exploring Reading, viewing, listening	Where could I go?	<ul style="list-style-type: none"> Determine the best initial leads to relevant information Determine possible immediate access to background information (gaining the larger picture) Consider information sources within and beyond the library
	How do I get the information?	<ul style="list-style-type: none"> Identify relevant materials Sense relationships between information items (supporting our countering each other; one leading to others based on sources cited) Determine which resources are most likely to be authoritative and reliable Consider and state the advantages and disadvantages of bias Consider discovered facts and search for counter facts Consider opinions and look for counter opinions Determine extent of need for historical perspective
Assimilation Accepting, incorporating, rejecting	How shall I use to resources?	<ul style="list-style-type: none"> Determine if the information is pertinent to the topic? Estimate the adequacy of the information? Test validity of information? Group data in appropriate categories according to appropriate criteria
	Of what should I make a record?	<ul style="list-style-type: none"> Extract significant ideas and summarize supporting, illustrative details Define a systematic method to gather, sort, and retrieve data Combine critical concepts into a statement of conclusions Restate major ideas of a complex topic in concise form Separate a topic into major components according to appropriate criteria Sequence information and data in order to emphasize specific arguments or issues
Inference Application for Solution and meaning	Have I got the information I need?	<ul style="list-style-type: none"> Recognize instances in which more than one interpretation of material is valid and necessary Demonstrate that the information obtained is relevant to the issues of importance if necessary, state a hypothesis or theme and match evidence to the focused goal of the paper or project Reflect, edit, revise, and determine if previous information search and analysis steps should be repeated
	How should I present it?	<ul style="list-style-type: none"> Place data in tabular form using charts, graphs, or illustrations Match illustrations and verbal descriptions for best impact Note relationships between or among data, opinions, or other forms of information Propose a new plan, create a new system, interpret historical events, and/or predict likely future happenings Analyze the background and potential for reception of ideas and arguments by the intended audience Communicate orally and in writing to teachers and peers
Reflection Adjustment for additional questioning	What have I achieved?	<ul style="list-style-type: none"> Accept and give constructive criticism Reflect and revise again, and again if necessary Describe the most valuable sources of information Estimate the adequacy of the information acquired and judge the need for additional resources State future questions or themes for investigation Seek feedback from a variety of audiences

Project developed by Katherine Baker, IU-SLIS, Spring 2005.